

Science

FameLab helps to reveal the secrets of an infectious personality

The secret of charisma has been revealed by an experiment carried out on the entrants to FameLab, a nationwide talent hunt for the new faces of science.

By asking them to fill out a simple questionnaire, it has been possible to measure the charisma of each one on a scientific basis and reveal that this star quality rests on the exceptional ability of people to induce their own emotions and feelings in others.

The questionnaires were completed by more than 200 of the 300-plus people taking part in FameLab, a national competition launched by the Cheltenham Science Festival in partnership with the National Endowment for Science, Technology and the Arts (Nesta).

The study was carried out by Prof Richard Wiseman, a psychologist at the University of Hertfordshire, and is the first to examine the theory of "emotional contagion" and charisma in a public arena. "Charisma is hard to pin down; we all have a sense of someone having it, but it is difficult to explain why," said Prof Wiseman. "These results reveal

that emotional infection plays a key role."

For his study, Prof Wiseman asked FameLab entrants to complete the affective communication test, a 13-item questionnaire designed by Prof Howard Friedman of the University of California, Riverside. Questions probe whether you like to touch people when you talk to them, enjoy being the centre of attention and can keep still when you hear good dance music.

A clear relationship emerged between charisma ratings by FameLab judges and questionnaire scores, suggesting that highly charismatic people can easily and unconsciously telegraph their own emotions to those around them.

"Interestingly, those who scored highly for charisma and in the questionnaire on emotional contagion were also those that also did well in the competition," said Prof Wiseman. "So charisma is obviously key to communicating science".

As a group, the FameLab applicants had an average score of 86, which is high. The mean of

the American population is 71. "The finalists are especially high – as a group, they have a mean of 90," said Prof Wiseman, adding that the number one Toyota salesman in America scored only nine points more. "There were no significant differences between men and women, and each area (Manchester, Belfast, London and so on) had roughly the same charisma levels."

An infectious personality can hold sway in many and various ways, he said. "There are loads of studies showing that we unconsciously mimic almost all aspects of other people's behaviour – the rhythm of their speech, facial expressions, posture, body language and so on – and that all of this influences our emotions (thus the facial feedback hypothesis, whereby we force a smile to feel happy, as opposed to feel happy and smile)."

"Thus my prediction is that when we see a good emotional transmitter (like the FameLab finalists), without realising it, they are good at getting us to do what they are doing, in terms of facial expression, energy and so on. It is an unusual presentation



FameLab entrant Elizabeth Watts

skill because you have to be able to feel strong emotions yourself, give out the signals that others mimic, and not be unduly influenced by others."

Prof Wiseman believes charisma has deep evolutionary roots – we are social animals and it binds the social fabric if hoi polloi experience the same emotions felt by the group leaders

(which is why they may become leaders in the first place). "The bottom line is that we know the FameLab people are giving out the right signals, and I suspect that for good evolutionary reasons, members of the audience are acting as unconscious mimics. That is having an unusual and dramatic impact on their emotion, and that, in turn, is causing them to attribute charisma to the presenters."

To support the experiment, Channel 4 is also launching a FameLab website (www.channel4.com/famelab), which includes its own mass-participation experiment about perceptions of charisma and a voting facility for users to pass judgment on the 12 FameLab finalists. This is your chance to serve as one of the panel of judges, ensuring that at least one of the finalists to get through to the final six will be chosen by a broad audience.

"We are really excited about finding the new face of science with the Cheltenham Science Festival," says Heather Rabbatts, Channel 4 head of education. "We want presenters with emotion, charisma and the best

scientific brains. Perhaps this experiment will provide the key to our search."

FameLab is also supported by Pfizer and *The Daily Telegraph*. A dozen finalists have been selected from more than 300 entrants to regional heats. Each one will have just four minutes to impress a judging panel, including myself, Lord Winston, professor of fertility studies and BBC presenter, and author, broadcaster and Nesta trustee Simon Singh at the finals on June 11 at the Cheltenham Science Festival.

Prof Wiseman has drawn up a few charismatic tips for the finalists: adopt an open body posture that will help attract other people to you; move around to produce the feeling of energy and enthusiasm; speak in a clear, fluent, forceful and articulate way that evokes imagery, energy and action; constantly alter the intonation and pacing of your delivery to maintain interest. In general, use an upbeat tempo, only occasionally switching to a slow delivery to create tension and emphasise key points.

The FameLab finalists are: Prof

Trevor Cox; Dr Andrew Bebb; Dr Maggie Aderin-Pocock; Luke Jerram; Dr Shini Somarathne; Dr Mark Lewney; Simon Watt; David Wharton; Dr Matt Wilkinson; Rebecca Lloyd-Evans; "Bex" ?????; Christopher Rowlands; and Dr David Booth. The overall FameLab champion will appear as a guest presenter on Channel 4, take part in events across Britain and receive £2,000 in prize money. **RH**

● *The Cheltenham Science Festival takes place from June 8-12. For a brochure call 01242 237377, email boxoffice@cheltenham.gov.uk or visit www.cheltenhamfestivals.org.uk.*

We have negotiated a rate of £110 for a double/twin room (£65 for a single) per night B&B in Cheltenham's four-star Queen's Hotel, located two minutes' walk from most of the festival venues.

Prices are based on a minimum two-night stay between Thursday June 9 and Sunday June 12. Call Cheltenham TIC to book on 01242 517110, quoting Telegraph Science reader offer

Cheltenham Science Festival: a unique experiment to blend flesh and machine could help to create a 'cyborg', says Roger Highfield

The girl with eyes in the back of her head

Marieke Rohde has eyes in the back of her head.

Here she is demonstrating one of the ways in which she hopes to create "cyborgs" – blends of flesh and machine – in a unique experiment that will be conducted in public next month.

One cyborg will feel magnetism. A second will be able to "see" the world through a robot's artificial eye. The third will sense metal objects hidden behind walls. Augmented with their artificial senses, they will gather at the Cheltenham Science Festival where they will demonstrate how technology can endow humans with new powers.

Ms Rohde is one of a group of researchers from the Centre for Computational Neuroscience and Robotics (CCNR) at the University of Sussex who, with engineer and "sonic artist" Sarah Angliss, want to reveal what happens when human senses are rewired.

This investigation of a novel scientific field has broad implications for medicine and the study of human and machine intelligence. Indeed, despite the best efforts of the Borg in *Star Trek*, it has implications for the entertainment business too.

In one sense, the cyborg revolution has already started. "Spectacles,

notebooks, computers and the internet are tools that we're already using to extend our vision, memory, thinking and other powers beyond the limitations of the human body," says Ms Angliss. "You're almost certainly a cyborg already."

But at the Cheltenham festival, which is sponsored by *The Daily Telegraph*, the Sussex team plans to go much further.

Visitors to the festival will be able to try out some sense-warping cyborg experiments on themselves. At present, the team plans to turn vision upside down, convert sight into stomach vibrations – so trainee cyborgs can see by "touch" – and swap high frequency sounds for low, and so on. Whatever the final format of experiments they decide on, "we hope to get rid of the old idea that you see with the eyes and hear with the ears. It's about sensing with the brain," says Ms Angliss.

The main experiment will begin with the launch of the festival on June 8, when three volunteers will be hooked up to electronics that will give them new sensory powers, such as the ability to sense magnetism or see behind them. For two days, they will adapt to life as a cyborg.

"The devices are cunningly simple, hacked together from mobile phone vibrators, burglar alarm spares, metal detectors and so on," says Ms



Sight unseen: Marieke Rohde is wearing a head-mounted display which gives her rear-view vision. The device relays images from a camera on the back of her head to miniature screens in front of her eyes. A vibrator on her index finger acts as an alarm. It warns her when she is getting too close to an obstacle. The vibrator is controlled by distance sensors attached to the front and rear of her torso

MARTIN POPE

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Angliss. "But in theory this is all we need to transform a "naked" human into an animal-machine hybrid with an entirely new experience of the world."

"Our volunteers may feel confused by the sensations they pick up from the electronics at the beginning of the week," adds Ms Rohde, a doctoral student investigating cognitive science and evolutionary robotics. "But we expect they'll adapt to them – and hopefully find them useful – within a few hours."

In our picture, Ms Rohde is demonstrating the "retrowoman" set-up, where a volunteer will be able to see out of the back of their heads. This is a milder version of a classic experiment conducted three decades ago by a pioneer in the field, Dr Paul Bach-y-Rita of the University of Wisconsin, Madison.

He blindfolded people, put a camera on their heads and routed the visual images from the camera to vibrators taped to their backs. Soon they were able to "see" large objects, even flickering candles, depending on the way their backs were tickled.

Dr Bach-y-Rita and his team have followed up this work with the Brainport – a device that relays data from cameras and other sensors to an array of electrodes that send small electric pulses to the tongue, confusing mouth feel with sight. After just two training sessions, a blind person is able to catch a ball with the help of this device.

Even though the new sense was tactile, this was seeing, not feeling; subsequent studies have shown that the stimulation sensed on their backs and tongues was processed in the visual cortex of the brain. "This is an amazing example of brain plasticity – it challenges the

classic idea of hardwired connections between the brain areas and sensory organs. You really don't need eyes to see, just the right kind of changing, sensory signals," says Ms Rohde. The Cheltenham experiment will end on June 10, when the three volunteers will tell an audience what it's like to be a cyborg as they show off some of their new-found skills and reveal the

Imagine a cyborg customs officer equipped with a chemical sensor who can sniff out drugs or a cyborg sculptor with wrap-around vision

highlights of their time with rewired senses.

The experiment will reveal how long it takes cyborgs to use their new senses as naturally as conventional sight and hearing. Just as interesting to the Sussex team will be to find out how useful the cyborgs find their new senses and whether they can live and work in unimagined ways. There are many possible

uses of this technology. "Imagine a cyborg customs officer equipped with a chemical sensor who can sniff out drugs or a cyborg sculptor with wrap-around vision," said Ms Angliss.

There are medical applications too: tactile devices, hooked up to cameras and worn on the body, have already been used to enable blind people to "see". People with balance problems can be prevented from falling over with the help of a hat that measures movements with accelerometers and turns this information into tongue vibrations (see www.brainportinfo.com/Madison/cheryldemo1.ram). This work offers the hope of technological fixes for a whole host of other disabilities and chronic diseases.

Until now, most experiments in sensory substitution and adaptation have kept to the familiar territory of the five senses. The Sussex team is also planning to equip one of their volunteers with an awareness of magnetism – allowing them to extend the senses into territory familiar to other creatures. Dr Dylan Evans of the University of the West of England says: "The animal kingdom abounds with other, less familiar sensory modalities. Bats use sonar, Japanese eels can detect magnetic fields, and sharks are sensitive to the electric fields generated by fish."

The hope is that human cyborgs may one day enter new sensory domains to know what it really feels like for a shark to encounter a school of fish, or for a bat to be trapped in a belfry.

The Cyborg Experiment will be run at the Cheltenham Science Festival on Friday June 10. For details ring 01242 227979 or e-mail boxoffice@cheltenham.gov.uk

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